AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (previously presented): A system for interconnecting an Internet protocol version 6 (IPv6) network and an Internet protocol version 4 (IPv4) network, comprising IP packet transmitting apparatuses transmitting IP packets between IPv6 nodes and IPv4 nodes and including:

a first IP packet transmitting apparatus transmitting IP packets; and

a second IP packet transmitting apparatus transmitting IP packets when the number of IP packets to be transmitted exceeds the processing capacity of the first IP packet transmitting apparatus,

wherein the first and second IP packet transmitting apparatuses share processing state information of the IP packets using a predetermined message.

2. (previously presented): The system of claim 1, wherein each of the first and second IP packet transmitting apparatuses transmits a packet via network address translation-protocol translation (NAT-PT).

3. (previously presented): A system for interconnecting an IPv6 network and an IPv4 network, comprising NAT-PT apparatuses transmitting IP packets between IPv6 nodes and IPv4 nodes and including:

a first NAT-PT apparatus transmitting IP packets; and

a second NAT-PT apparatus transmitting IP packets when the number of IP packets to be transmitted exceeds the processing capacity of the first NAT-PT apparatus,

wherein the first and second NAT-PT apparatuses share processing state information of the IP packets using a predetermined message.

4. (previously presented): The system of claim 1, wherein the predetermined message is an Internet control message protocol version 6 (ICMPv6) redirect message defined in a neighbor discovery protocol (NDP).

5. (previously presented): The system of claim 4, wherein the ICMPv6 redirect message comprises:

a flag bit that indicates the processing state of the first NAT-PT apparatus; and

a target address field which stores the address of the second NAT-PT apparatus adjacent to the first NAT-PT apparatus.

6. (previously presented): The system of claim 3, wherein a packet processing state of the first or second NAT-PT apparatus is indicated by whether or not the current processing state of packets that is assessed by a size of an IPv6-IPv4 address translation mapping table installed in the corresponding NAT-PT apparatus or a rate of use of the mapping table is equal to or greater than a predetermined threshold that is indicative of the packet processing capacity of the NAT-PT apparatus.

7. (previously presented): The system of claim 3, wherein a packet processing state of the first or second NAT-PT apparatus is indicated by whether or not the current processing state of packets that is assessed by a state of use of an IPv4 address pool installed in the corresponding NAT-PT apparatus is equal to or greater than a predetermined threshold that is indicative of the packet processing capacity of the NAT-PT apparatus.

8. (original): An NAT-PT apparatus comprising:

a determination unit which receives an IPv6 packet and determines whether or not the received IPv6 packet is to be processed according to the current packet processing state of the NAT-PT apparatus;

an IPv4 address pool which stores IPv4 addresses with which the address of an IPv6 node which transmitted the IPv6 packet is mapped to an IPv4 address and then used;

a mapping table generation and storage unit which generates and stores a mapping table for mapping an IPv4 address corresponding to the address of the IPv6 node; and

an IP header translation unit which translates an IPv6 packet header into an IPv4 packet header.

9. (previously presented): The apparatus of claim 8, wherein the determination unit determines the current packet processing state of the NAT-PT apparatus based on whether or not a value according to a size of the mapping table, a rate of use of the mapping table, or a state of use of the IPv4 address pool is equal to or greater than a predetermined threshold.

10. (original): The apparatus of claim 8, wherein if it is determined that the NAT-PT apparatus is in a state of being incapable of processing the received IPv6 packet, the determination unit reports the state to the IPv6 node which transmitted the IPv6 packet.

11. (original): The apparatus of claim 10, wherein reporting the state of the NAT-PT apparatus being incapable of processing packets to the IPv6 node which transmitted the IPv6 packet is performed by using an ICMPv6 redirect message.

12. (original): The apparatus of claim 11, wherein the redirect message comprises:

a flag bit that indicates the state of the NAT-PT apparatus being incapable of processing packets; and

a target address field which stores an address of another NAT-PT apparatus.

13. (original): The apparatus of claim 8, wherein the IP header translation unit translates an IP header by using a stateless IP/ICMP translation (SIIT) algorithm.

14. (previously presented): A method of interconnecting an IPv6 network and an IPv4 network in an IPv6-IPv4 interconnection system comprising a plurality of NAT-PT apparatuses transmitting IP packets between the IPv6 nodes and the IPv4 nodes, wherein the NAT-PT apparatuses share processing state information of the IP packets, using a predetermined message.

15. (original): The method of claim 14, wherein the predetermined message is an Internet control message protocol version 6 (ICMPv6) redirect message defined in a neighbor discovery protocol (NDP).

16. (original): The method of claim 15, wherein the ICMPv6 redirect message comprises:

a flag bit that indicates the processing state of a particular NAT-PT apparatus; and

a target address field which stores the address of another NAT-PT apparatus.

17. (previously presented): The method of claim 14, wherein a packet processing state of a particular NAT-PT apparatus is indicated by whether or not the current processing state of packets that is assessed by a size of an IPv6-IPv4 address translation mapping table installed in the particular NAT-PT apparatus or a rate of use of the mapping table is equal to or greater than a predetermined threshold that is indicative of the packet processing capacity of the particular NAT-PT apparatus.

18. (previously presented): The method of claim 14, wherein a packet processing state of a particular NAT-PT apparatus is indicated by whether or not the current processing state of packets that is assessed by a state of use of an IPv4 address pool installed in the particular

NAT-PT apparatus is equal to or greater than a predetermined threshold that is indicative of the packet processing capacity of the particular NAT-PT apparatus.

19. (currently amended): An NAT-PT method performed in an NAT-PT apparatus, comprising:

(a) receiving an IPv6 packet and determining whether or not the received IPv6 packet is to be processed according to the current packet processing state of the NAT-PT apparatus;

(b) if the determination result indicates that the NAT-PT apparatus is capable of processing the received IPv6 packet, mapping an address of an IPv6 node which transmitted the IPv6 packet into an IPv4 address by using an IPv4 address pool which stores available IPv4 addresses; and

(c) translating a header of the received IPv6 packet into an IPv4 packet header; and providing a processed IPv6 packet.

20. (previously presented): The method of claim 19, wherein in step (a) the current packet processing state of the NAT-PT apparatus is determined based on whether or not a value according to a size of the mapping table, a rate of use of the mapping table, or a state of use of the IPv4 address pool is equal to or greater than a predetermined threshold to determine whether or not the received IPv6 packet can be processed by the NAT-PT apparatus.

21. (original): The method of claim 19, wherein in step (a), if it is determined that the NAT-PT apparatus is in a state of being incapable of processing the received IPv6 packet, the state is reported to the IPv6 node which transmitted the IPv6 packet.

22. (original): The method of claim 21, wherein reporting the state of the NAT-PT apparatus being incapable of processing packets to the IPv6 node which transmitted the IPv6 packet is performed using an ICMPv6 redirect message.

23. (original): The method of claim 22, wherein the redirect message comprises:

a flag bit that indicates the state of the NAT-PT apparatus being incapable of processing packets; and

a target address field which stores an address of another NAT-PT apparatus.

24. (original): The method of claim 19, wherein in step (c) an IP header is translated using a stateless IP/ICMP translation (SIIT) algorithm.

25. (previously presented): A computer readable medium having embodied thereon a computer program for an interconnection method of interconnecting an IPv6 network and an IPv4 network in an IPv6-IPv4 interconnection system comprising a plurality of NAT-PT apparatuses transmitting IP packets between the IPv6 nodes and the IPv4 nodes, wherein the NAT-PT apparatuses share processing state information of the IP packets, using a predetermined message.

26. (original): A computer readable medium having embodied thereon a computer program for an NAT-PT processing method performed in an NAT-PT apparatus, comprising:

(a) receiving an IPv6 packet and determining whether or not the received IPv6 packet is to be processed according to the current packet processing state of the NAT-PT apparatus;

(b) if the determination result indicates that the NAT-PT apparatus is capable of processing the received IPv6 packet, mapping an address of an IPv6 node which transmitted the IPv6 packet into an IPv4 address by using an IPv4 address pool which stores available IPv4 addresses; and

(c) translating a header of the received IPv6 packet into an IPv4 packet header.

27. (currently amended): A method of interconnecting an IPv6 network and an IPv4 network in a network comprising at least one IP packet transmitting apparatus transmitting IP packets between the IPv6 nodes and the IPv4 nodes, the method comprising:

(a) receiving a DNS message for searching for an IPv4 address of a destination domain name, transmitting the DNS message to a DNSv4 server, and receiving the IPv4 address of the destination domain name;

(b) allocating a predetermined prefix to the received IPv4 address to translate the IPv4 address into an IPv6 address; and

(c) transmitting the translated IPv6 address to a corresponding IPv6 node,

wherein the predetermined prefix is the prefix of an apparatus with the least load among the at least one apparatus for transmitting IP packets, the apparatus for transmitting IP packets with the least load being identified by using a predetermined message regarding information on the load of the at least one apparatus for transmitting IP packets.

28. (previously presented): The method of claim 27, further comprising (d) transmitting a data packet to the IPv6 address as a destination address.

29. (original): The method of claim 27, wherein the predetermined prefix is one of a plurality of prefixes allocated in a sequential order to the at least one apparatus for transmitting IP packets.

30. (canceled).

31. (currently amended): The method of claim ~~30~~27, wherein the predetermined message is created using a Code field of an ICMPv6 redirect message and a QType field of a reply message.

32. (currently amended): A system for interconnecting an IPv6 network and an IPv4 network in a network comprising at least one IP transmitting apparatus transmitting IP packets between the IPv6 nodes and the IPv4 nodes, the system comprising:

a DNS message receiving portion which receives a DNS message for searching for an IPv4 address of a destination domain address;

an IPv4 address receiving portion which transmits the received DNS message to a DNSv4 server and receives an IPv4 address of the destination domain name from the DNSv4 server;

an address translation portion which allocates a predetermined prefix to the received IPv4 address to translate the IPv4 address to an IPv6 address; and

a transmitting portion which transmits the translated IPv6 address to a corresponding IPv6 node,

wherein the predetermined prefix is the prefix of an apparatus with the least load among the at least one apparatus for transmitting IP packets, the apparatus for transmitting IP packets with the least load being identified by using a predetermined message regarding information on the load of the at least one apparatus for transmitting IP packets.

33. (original): The system of claim 32, wherein the predetermined prefix is one of a plurality of prefixes allocated in a sequential order to the at least one apparatus for transmitting IP packets.

34. (canceled).

35. (currently amended): The system of claim ~~34~~32, wherein the predetermined message is created using a Code field of an ICMPv6 redirect message and a QType field of a reply message.